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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/824,399	04/15/2004	Mu-Kyeng Jung	SEC.1127	5525
20987	7590	12/09/2005	EXAMINER	
VOLENTINE FRANCO, & WHITT PLLC ONE FREEDOM SQUARE 11951 FREEDOM DRIVE SUITE 1260 RESTON, VA 20190			LE, THAO X	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 12/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/824,399	Applicant(s) JUNG ET AL.	
	Examiner Thao X. Le	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 9-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>04/15/05, 06/23/05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-8 in the reply filed on 08 Nov. 2005 is acknowledged.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2 and 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by US 6500724 to Zurcher et al.

Regarding claim 1 Zurcher discloses a semiconductor device in fig. 1 comprising: an insulating layer 12, col. 2 line 11, an interconnection 16, col. 2 line 17, including a body of copper, col. 1 line 63, surrounded by said insulating layer 12; a capping layer 18, col. 2 line 16, that covers said insulating layer 12, said capping layer 18 having a window that exposes said interconnection 16, and a metal resistor 28, col. 2 line 35, that extends along said capping layer 18 and contacts a top surface of the interconnection 16 through said window in the capping layer 18.

Regarding claim 2, Zurcher discloses the semiconductor device wherein the metal resistor 28 is of a material selected from the group consisting of titanium, titanium nitride, tantalum, tantalum nitride, and tantalum silicon nitride, col. 3 lines 23-25.

Regarding claim 5, Zurcher discloses a semiconductor device comprising: a electrically conductive.

Regarding claim 6, Zurcher discloses a semiconductor device in fig. 1 comprising: an insulating layer 12 an interconnection 16 including a body of copper 16 surrounded by said insulating layer 12; an MIM capacitor (20/22/24) disposed on said insulating layer 12, said MIM capacitor including a lower electrode 20, a dielectric 22, and an upper electrode 24, col. 2 lines 25-28, a capping layer 18 that covers said insulating layer 12, said capping layer having a window that exposes said interconnection 16, and a metal resistor 28 that extends along said capping layer 18 and contacts a top surface of the interconnection 16 through said window in the capping layer 18, said metal resistor 28 being of the same material as one of said lower electrode and said upper electrode of the MIM capacitor, col. 2 lines 35-38.

Regarding claim 7, Zurcher discloses the semiconductor device wherein said capping layer 18 extends beneath said lower electrode 20 of the MIM capacitor, fig. 1.

Regarding claim 8, Zurcher discloses the semiconductor wherein said lower electrode 20 of the MIM capacitor is surrounded by said insulating layer 12, and said capping layer 18 extends between said upper electrode 24 and said lower electrode 20 so as to serve as said dielectric of the MIM capacitor, fig. 2.

3. Claims 5 is rejected under 35 U.S.C. 102(b) as being anticipated by US 6534374 to Johnson et al.

Regarding claim 5, Johnson discloses a semiconductor device in fig. 10 comprising: an electrically conductive interconnection 24, col. 5 line 15, an insulating layer 30, col. 5 line 38, covering said interconnecting 24, fig. 8, an electrical contact 99, col. 8 line 18, that extends through said insulating layer 30, fig. 10, and a metal resistor

32, col. 5 line 66, extending on said insulating layer 30 and contacting said electrical contact 99, fig. 10.

4. Claim 5 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 6359328 to Dubin.

Regarding claim 5, Dubin discloses a semiconductor device in fig. 5 comprising: an electrically conductive interconnection 14a, col. 3 line 19, an insulating layer 18, col. 3 line 38, covering said interconnecting 14a, fig. 5, an electrical 22a, col. 5 line 30, that extends through said insulating layer 18, fig. 5, and a metal resistor 26, col. 5 line 67, extending on said insulating layer 18 and contacting said electrical contact 22a, fig. 10.

Although, Dubin does not expressly discloses layer 26 is a metal resistor layer. However, the layer 26 of Dubin is function as a resistor layer because Dubin discloses layer 26 substantially identical to that of the claims and having identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over US6500724 to Zurcher et al. in view of US 6534374 to Johnson et al.

Regarding claim 3-4, Zurcher does not disclose the semiconductor device wherein the metal resistor 28 has a thickness of about 30 to 1000 angstroms and wherein the capping layer 18 is of a material selected from the group consisting of silicon nitride and silicon carbide.

However, Johnson discloses a semiconductor device in fig. 10 comprises a metal resistor layer TiN 32 has a thickness of about 30 to 1000 angstroms, col. 5 lines 58-65 and wherein the capping layer 30 is of a material selected from the group consisting of silicon nitride and silicon carbide, col. 5 lines 40-41. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the cap layer material teaching of Johnson with Zurcher's device, because such barrier dielectric or etch stop material is typical in the art and would have provided the same function for intended use, MPEP 2144.07.

With respect to the thickness, it would have been obvious to one of ordinary skill in art to use the thickness teaching Johnson in Zurcher's device in the range as claimed, because it has been held that where the general conditions of the claims are disclosed in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation. See *In re Aller*, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955).

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao X. Le whose telephone number is (571) 272-1708. The examiner can normally be reached on M-F from 8:00 AM - 4:30 PM.

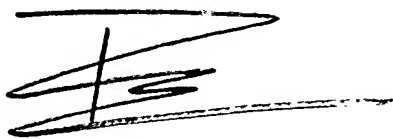
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on (571) 272 -1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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A handwritten signature in black ink, appearing to be 'Thao X. Le', with a long horizontal stroke extending to the right.

Thao X. Le

01 December 2005